

El Malpais

National Conservation Area

FY2013 Manager's Report

BLM

New Mexico

NATIONAL
CONSERVATION
LANDS



Table of Contents

- 1 El Malpais National Conservation Area Profile4
- 2 Planning and NEPA5
- 3 Year’s Projects and Accomplishments..... 6
- 4 Science 12
- 5 Resources, Objects, Values, and Stressors 15
- 6 Summary of Performance Measures.....24

El Malpais NCA Profile

Designating Authority

Designating Authority: Section 301 of the Public Law 100-225

Date of Designation: December 31, 1987

Location and Acreage

Total acreage: 262,100 acres **BLM acreage:** 227,100 **Non-BLM acreage:** 35,000

The El Malpais National Conservation Area is located south of Grants, New Mexico, 80 miles west of Albuquerque.

Contact Information

Unit Manager	Phone	E-mail	Mailing Address
Kenneth Jones-Supervisory Park Ranger	505-287-6603	kjones@blm.gov	P.O. Box 846 Grants, NM 87020

Field Office	District Office	State Office
Rio Puerco	Albuquerque	New Mexico

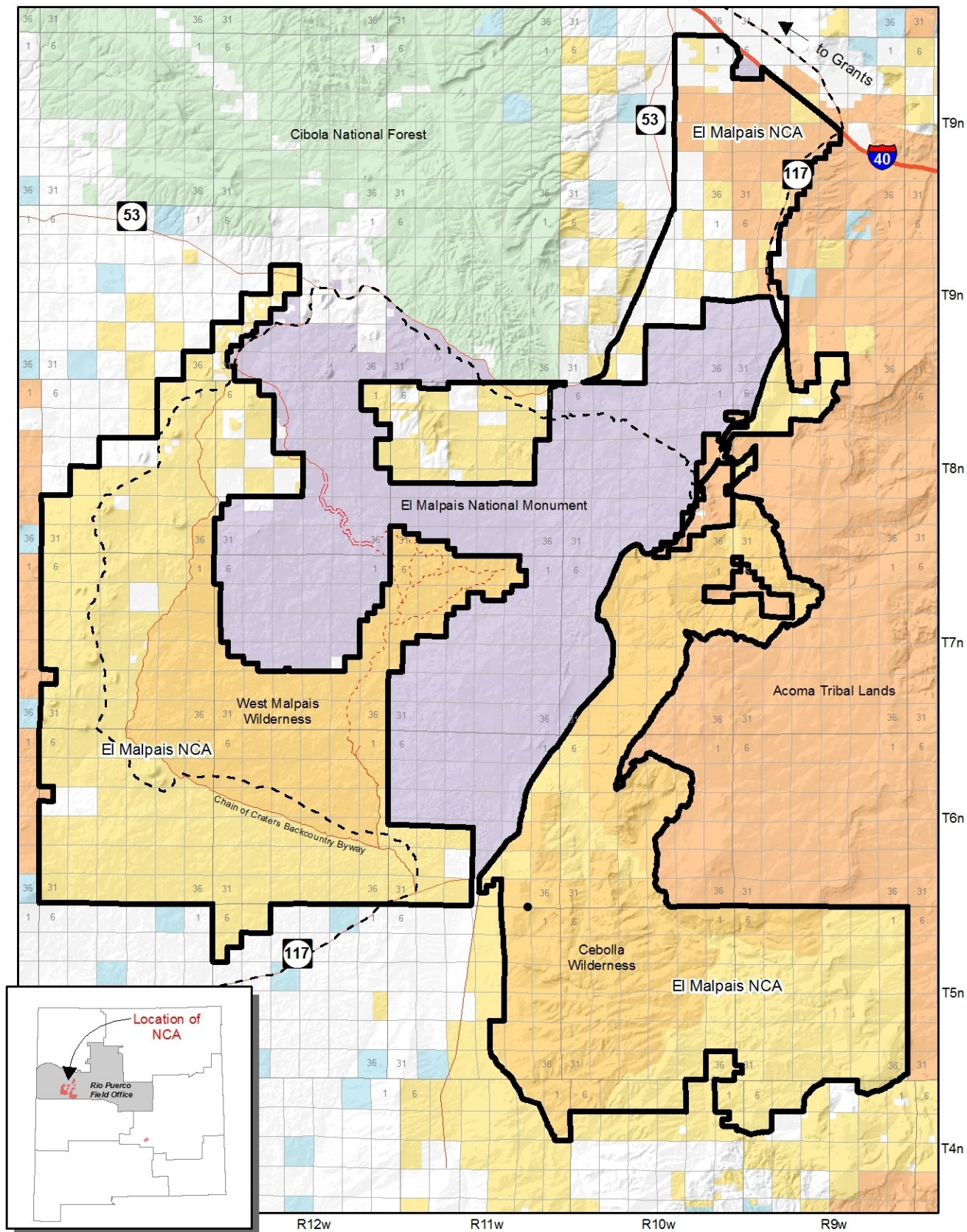
Managing Partners

N/A

Staffing

The work of the NCA is accomplished through a dedicated staff assigned to the NCA and the Resources Staff of the BLM Rio Puerco Field Office. The dedicated staff includes a supervisory park ranger, five park rangers, and a maintenance worker. One park ranger and the maintenance worker position are both vacant. The Rio Puerco staff working in the NCA includes the field manager, archeologist, forester, wildlife biologist, hydrologist, rangeland management specialist, and range technician, each devoting up to 40 percent of their time. The BLM works cooperatively with the National Park Service and U.S. Forest Service to operate a regional visitor center which is located adjacent to the NCA.

El Malpais National Conservation Area



- | | |
|---|--------------------------|
| El Malpais National Conservation Area (NCA) | Interstate Highway |
| Bureau of Land Management | State Highway |
| Forest Service | County Road / Local Road |
| National Park Service | 2-track / 4WD |
| Private | Trail |
| State | Continental Divide |
| Tribal | National Scenic Trail |

0 2 4 6 8 10 Miles



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by BLM. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

Produced by the BLM New Mexico State Office Geographic Sciences Team Santa Fe, New Mexico

Planning and NEPA

Status of RMP

The El Malpais Plan was completed in September 2001, with the approval of the Record of Decision for the *Proposed El Malpais Plan and Final Environmental Impact Statement* (September 2000). The Approved El Malpais Plan amends the *Rio Puerco Resource Management Plan* (RMP). The Approved Plan also included some activity-level decisions for management of the resources of the Plan Area.

The El Malpais Plan is arranged as twenty-one separate sections for the various resources managed in the El Malpais Plan area. Those decisions and guidance that apply to more than one resource are duplicated in each of the resource sections. Each of the twenty-one resource plan sections is complete within itself in order to make consistent implementation of the Plan by Field Office resource specialists.

Status of Activity Plans

There are no individual activity plans.

Status of RMP Implementation Strategy

An RMP implementation strategy has been completed and an RMP evaluation report was completed in July, 2013. Key points from the strategy include actions on rangeland resources, recreation, vegetation, riparian, wildlife, forestry, fire management, realty, Native American uses, paleontological resources, and feral horses and burros.



Western Screech owl day roost in a fresh limb scar at the Joe Skeen Campground.

Year's Projects and Accomplishments

General Accomplishments

Wilderness

Wilderness characteristic monitoring was completed for both the Cebolla and the West Malpais Wilderness Areas.

Archaeology

A cultural resource inventory on the NCA historically has been project-driven with inventories completed for Section 106 compliance. Inventory on the NCA has ranged from reconnaissance surveys to Class II and Class III inventories. Class II and III inventories have resulted in approximately 8,450 acres examined for cultural resources. This acreage does not include acres of linear survey along trails and road corridors.

The longest serving staff member (Sheila Brewer, a volunteer researcher) retired this year from the NCA after completing an exhaustive 20-year field inventory of 94 historical and pre-historic rock art sites in six volumes.

Hydrology

A Student Conservation Association crew performed watershed restoration in the Cebolla Wilderness. They built loose-rock check dams in Cebolla Creek to reverse a homestead-era arroyo (gully) that has lowered the native canyon bottom and water table, as well as de-watered the stream banks and floodplain. The check dams are a simple and effective tool to stabilize the bed and raise its elevation by trapping sediment. This prevents further degradation and moves the stream toward a natural and stable hydrologic and vegetative condition. Permanent, repeatable cross-section monitoring stations measure treatment effectiveness. Early reports indicate increasing visible water present further downstream in the arroyo.



Student Conservation Association crew installs a loose-rock check dam in Cebolla Creek.



Degraded channel prior to installation of check dam.



Same channel after a check dam has trapped a year of sediment.

Fire/Forestry

The BLM thinned forty acres of piñon-juniper for forest health treatment just northwest of Cerro Comadre.

Funding provided by the New Mexico Department of Game and Fish Habitat Stamp Program, Wildlife Enhancement Funds, and BLM was utilized to accomplish approximately 610 acres of mechanical thinning (lop and scatter). These thinning treatments took place south and east of Cebolla Canyon in the Mertz Ranch area. The goal of the mechanical treatments was to cut patches ranging in size from half an acre to seven acres arranged throughout a 1,200 acres area to aid in producing desired fire effects, intensity, and spread. Those particular areas include meadow edges, canyon bottoms, and saddles. The patch cuts helped to create a natural mosaic pattern of diversity across the landscape, while establishing a fuel bed on the ground which will aid in the efforts to increase fire effects and spread when implementing a prescribed fire.

The treatments are designed for the restoration of ponderosa pine stands, grasslands, and meadows which are being encroached upon by piñon and juniper due to past land use. These areas reveal severe soil erosion due to vegetative changes. The placement and scattering of the slash from the patch cuts provided ground cover and a micro-climate to help native grasses and forbs get re-established in areas which are severely degraded, while reducing water run-off and sediment loss.

Current Areas of Focus

Fire

Depending on current conditions and the desired fuels treatment objectives, prescribed fire may or may not be applied immediately after forestry treatments. If the treatment area is deficient in native grasses, forbs, and ground cover, and is at risk of experiencing above normal erosion due to this deficiency, slash may not be burned immediately so as to allow the treatment area to recover and reestablished cover.

Slash can be burned under cooler, moderate conditions with lower fuel moistures which aid in the combustion of fuels. Slash burns can also be initiated under cooler temperatures and weather parameters more favorable to fire containment while still achieving most fuels treatment objectives. This is a safer and more practical alternative to burning in the middle of summer when fire management resources can be limited, burn bans are in effect, and vegetation and soil moistures are more susceptible to long term negative effects. Having the flexibility to burn and accomplish fuels treatment objectives while protecting the resource is of the utmost importance.

Forestry

Authorization began for permitted public removal of dead firewood, Christmas trees, and transplants outside of wilderness and wilderness study areas.

Education, Outreach, and Interpretation

Education

Make an Ecosystem - Rangers and volunteers presented twenty-two curriculum-based day-long programs in classrooms. Students were inspired to realize the natural, local balance of plants and animals. They split into competing groups to construct models of local landforms and surface water. They added plants and animals (using picture cards) proportionately to create sustainable habitats. They demonstrated which human and natural effects could topple their model. They compared and contrasted each other's models. This classroom model is exportable for use in any ecosystem at any time. The dinosaur-era version is especially popular.

Day-long field programs - Rangers and volunteers from the NCA created curriculum-based hikes and led four high school classes to volcanic and archaeological sites.

International Migratory Bird Day - Thirty-five students participated in indoor, ranger-led activities at the Northwest New Mexico Visitor Center.

8th Grade School Program - Presentations in Los Alamos Middle School to all 8th grade classes, connecting 280 students to the homestead history of the area.

Mc Kinley County Youth, Water, and Energy Festival - Area school students met at Red Rocks City Park where they rotated through stations. The BLM station presented a 20 minute demonstration on water conservation. On the second day, the BLM guided six classes through "Make Your Own Ecosystem." The 2 days of programs reached 825 middle school students from the Gallup area.

Hands on the Land: Los Alamos Middle School (LAMS) - 225 seventh grade students in seven groups from LAMS visited seven learning stations along the NCA's one-mile Nature Trail with LAMS teachers and mentor-guides. Guides and teachers invited the students to experience this year's theme, "Thrive in Grants. How did animals and people do it? Will you?" Students stayed in explorer-mode throughout the day, and were inspired to connect their experiences at all seven stations and the one-mile hike.

Hands on the Land: Futures Foundation Family Center - BLM rangers presented 35 days of after-school programs to underserved elementary and high school students in a Grants Community-funded project to engage at-risk youth.

Take It Outside

Rangers from the NCA hosted and led two youth groups on all-day wilderness immersion adventures. The first trek was a Native American group. The second trek was an amalgam of youth from the science, technology, engineering, and mathematics group of high school students poised for college.

Outreach

- Weekly 15-minute ranger radio interviews on current NCA trends and events;
- Program fliers and area newspaper articles;
- *Albuquerque Hiking Meetup* announced and enrolled public ranger hikes online; and
- *4 Corners Geotourism* advertised events on the *National Geographic* website

Interpretation

Art walks - Artists and photographers from the surrounding area join this monthly outing to explore seldom seen areas of the NCA and gain inspiration for their art. Artists bring their easels, paints, pencils, and cameras and showcase the hidden beauty of the NCA. This has been a monthly program for over 3 years.

Ranger Station Gallery - This is Publicly-displayed art created by Art Walk participants.

Senior Van Tour - These are ranger-led van tours in the NCA to local seniors.

Night Hikes - These monthly summer “evening sensory” walks are geared to families to get children of all ages outside after dark. This includes walking without flashlights, letting other senses help find the way, and hands-on activities to illustrate how the senses work.

Petroglyph Calendar Wilderness Hikes - This is a day-long adventures in wilderness and NLCS lands to Ancestral Puebloan archaeological sites. Hikers observe ancient and still-functioning stone calendars. They discover native flowers, wild birds, and ancient shorelines with shark teeth and seashells. Participants tracked wild animals, practiced orienteering, climbed a volcano, and followed lava tubes.

Haunted Homestead Hike - This is an annual autumn 5-mile hike to a stabilized 1930s-era homestead. Rangers, dressed in period clothing, discussed life as a homesteader prior to the designation of the NCA.

Volcano Hike - Visitors joined a ranger and discovered native flowers, wild birds, and over 1.5 billion years of geologic upheavals. They tracked wild animals, practiced orienteering, climbed a volcano, and followed lava tubes.

Ranger Station - 9,760 visitors came to the BLM’s primary Ranger Station designed with a blend of Navajo, Pueblo, and modern architecture. The Station is the gateway to the east side of the NCA as well as a major stop-over for an Albuquerque to Phoenix route.

Northwest New Mexico Visitor Center - 24,877 visitors came to the BLM, National Park Service (NPS), U.S. Forest Service interagency Visitor Center. The Center is a spacious structure with grand views of the lava, mesas, and mountains. Located on NPS land, the Center is staffed by all agencies and management is rotated between the agencies annually.

Partnerships

National Park Service - Northwest New Mexico Visitor Center and collaborative interpretive hikes;
U.S. Forest Service - Northwest New Mexico Visitor Center and collaborative interpretive hikes;
Cottonwood Gulch - Collaborative interpretive youth programs;
Futures Foundation - Collaborative interpretive youth programs;
New Mexico State University - Collaborative interpretive youth programs;
Volunteers For the Outdoors - Trail work; and
Albuquerque Wildlife Federation - Wetlands restoration

Volunteers

Sixteen long-term volunteers assisted with Ranger Station operations, school programs, public ranger programs, trail work, and archaeological site stewarding. Cottonwood Gulch and Volunteers for the Outdoors worked on volunteer service projects, which provided 2,136 hours of volunteer service to the NCA.

Budget

The total base budget for the NCA in the 1711 funding source was \$297,000. One time funding in the 1711 funding source was \$86,000. In addition to the 1711 sources, approximately \$258,000 came from BLM programs such as recreation, range, wildlife, and cultural resources support work.

Land or Easement Acquisitions

N/A



Cebolla Wilderness

Anthropogenic Landscape Change in the Cebolla Creek Area, El Malpais NCA: This project is focused on understanding the chronological, environmental, social, and economic aspects of the 20th century homesteading period in the Cebolla Creek area of the NCA. Research indicates that late 19th and 20th century land-use (which included homesteading, grazing, row-crop agriculture, and logging) had a significant impact on the landscape. Such relatively new land use practices effected fire frequency, developed a large arroyo system, and may have played a role in the initiation of hill-slope erosion. It may have also initiated widespread ecosystem changes. These are changes that the BLM has been addressing through ongoing ecological restoration.

Land use prior to the 20th century in the NCA is not well documented. The precise interaction of human activities, climate, and vegetation which govern the thresholds of degradation are not precisely known. Archaeologists have begun to describe the role of human agency in the formation of landscapes. This work parallels efforts to articulate discipline-specific questions and integrative themes for global change research. In order to make reliable inferences about when, where, and how thresholds for degradation where crossed, the chronology and spatial scale for significant anthropogenic disturbance must be reconstructed and compared to observed landscape-scale changes in hydrologic and soil-geomorphic variables.

This single-year project will delineate specific aspects of human land use via dendro-archaeological sample collection and synthesis of existing cultural resource data. Specifically, the Laboratory of Tree Ring Research at the University of Arizona (LTRR) will be collecting dendro-archaeological samples from two sawmill sites and adjoining hill-slopes, and synthesizing all tree ring samples collected from the area by the LTRR during the course of other projects. Preliminary research at the sawmill sites suggests that the structures and associated debris piles were created in one or possibly two seasons. An important aspect of this work will be to quantify how many ponderosa pine trees were removed from the landscape in those 18+/- months. Our current estimates suggest numbers greater than 10,000 trees.



Human-Environmental Interactions in Rural Historic Landscapes: Dendroarchaeology of Two Logging Sites in the El Malpais National Conservation Area, Nicholas V. Kessler, 2013

Tree-ring dates obtained thus far from the Cebolleta Sawmill Sites indicate that a major episode of logging occurred between 1945 and early 1947, with the majority of cutting taking place in the year 1946. This is supported by the presence of diagnostic artifacts with manufacturing age ranges from 1943 to 1947, as well as limited census information. The small number of dates obtained from structural contexts at LA166696 and LA166697 indicate that these buildings were probably purpose-built to support milling activities during 1946. Based on a single tree ring date from LA166696, and the date ranges of observed artifacts, milling probably continued through at least 1948.

Based on these results, ongoing work conducted in the NCA, a review of pertinent literature, and previous experience with rural agricultural and industrial archaeological sites, the following conclusions are drawn regarding the potential for future research: (1) BLM management, and a general lack of development since the mid-20th century, has resulted in remarkable preservation of historic sites in the NCA; (2) Enough datable timber is present at these sites to allow a detailed chronology of historic settlement and land use for the area; (3) Diverse dendro-chronological and archaeological methodology is sufficiently developed to allow future research to reconstruct a record of environmental degradation and link these processes in time with human agency and natural forces; and (4) This proposal is in-line with interdisciplinary calls for research on the human-landscape interface using integrative methodologies and common metrics.



Winter in the NCA



Volunteer Archaeological Site Steward conducting monitoring in the Cebolla Wilderness. The view is north by northeast up Lobo Canyon. Cebolla Canyon is visible from right to left.

Resources, Objects, Values, and Stressors

La Ventana Natural Arch and other Geological Resources

Jurassic desert sandstones dominate much of the northern portion of the NCA along SR117. These thick sandstone beds form precipitous cliffs which contain numerous small arches and natural bridges capped by thin Cretaceous sands and clays. The largest natural arch in the NCA is La Ventana, which is 135 feet, making the second largest in New Mexico. To the south, Jurassic sediments give, then nearly 1000 feet of Cretaceous marine clays are exposed interspersed with beach sand sections. Trace fossils and oysters are common and cephalopods and shark teeth are rare. Younger cinder cone volcanos are numerous on the entire west side along the Chain of Craters (County Road 42). Lava from them fills the low lands in the southern and western portions of the NCA. Noteworthy too, are the larger shield volcano, Cerro Rendija, topped with a cinder cone, and Cerro Brillante, with its numerous volcanic bombs.

Stressors Affecting Geological Resources

Erosion - Past and current human activities are causing increased erosion. Natural diurnal and exfoliating thermal expansion and contraction is the primary agent of cliff and arch degradation. However, increased human use has caused mesa top run-off with high sediment loads increasing the effects of frictional and freeze-thaw weathering.

Elsewhere within the NCA, vehicles often leave designated roads to avoid muddy sections or to lessen walking distances. Erosion is accelerated in some of these cases by diminishing run-off retention from grasses and shrubs, and this is forming new arroyos.

Collecting - Collecting of fossils has the potential of depleting an already limited resource. Currently, collecting appears limited.

Status of La Ventana Natural Arch and	Trend
Good	Stable

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
262,100	209,680	209,680	20,970

Archaeological and Cultural Resources

The NCA contains abundant cultural resources including Paleo Indian, Archaic, and Ancestral Puebloan sites; historic Puebloan sites; Navajo sites; and Anglo and Hispanic homesteads. To date, 756 archaeological sites have been recorded within the NCA. These include historic homesteads and prehistoric pueblos with standing architecture and petroglyph panels of varying ages, some of which may be solar calendars. The Cebolla Canyon Prehistoric Community is an outstanding Ancestral Puebloan community consisting of more than 50 structural sites dating from before 800 C.E. to after 1300 C.E. One of these Pueblos, Oak Tree House, has impressive masonry architecture that has been stabilized. Most of the other recorded cultural resources are sites (some older than 800 C.E.) with subtle surface manifestations such as artifact scatters and rubble mounds. Most of the homestead sites with standing architecture have been formally recorded.

The cultural resources have been the subject of numerous scientific studies, including dendro-chronology studies, to better understand the relationship of past people with the land and how their activities have affected the current condition of the landscape.



Dittert Site

Stressors Affecting Archaeological Resources

Pot hunting - Collecting of artifacts has the potential to impact these resources. Currently, collecting appears limited.

Vehicles - Off-road vehicle use impacts have been noted at various sites. Anticipated authorized and unauthorized off-road vehicle use has the potential to significantly impact vulnerable sites.

Livestock - Livestock trails and trampling have been noted at numerous sites. Livestock trails through these sites have the potential to increase erosion and fragment ceramic, lithic, and structural elements. Several homesteads with standing architecture have been fenced for resource protection, but not all have been fenced. The fenced homesteads have had some limited stabilization work to slow the decay of the structures. However, there is not a formal monitoring program in place that tracks their condition.

Erosion - Past and current human activities are causing increased erosion which exposes cultural resources and contributes to their loss.

Status of Arch. and Cultural Resources	Trend
Good	Stable

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
262,100	75,800	8,050	800

Ecological Resources

Ecological resources within the NCA include the biotic and abiotic components that interact with each other. The living components of an ecosystem are the biotic factors (i.e. plants, animals, fungi, bacteria, etc.) that influence the other organisms or environment of an ecosystem. Biotic factors interact as producers, consumers, detritivores, competitors, herbivores, etc. The physical and chemical components of an ecosystem are the abiotic factors and include soil structure and chemistry, topographic relief and aspect, hydrology, weather and climate, atmospheric conditions, nutrient and salinity regimes, etc. It is the abiotic conditions in an environment which ultimately give rise to the biotic community present, although the biotic community can greatly influence and even change the abiotic community. An example of biotic-abiotic interactions on the NCA is water movement and sequestration on the landscape which influences and is impacted by wildlife activity and vegetation. It incorporates storage in tinajas and vernal pools, infiltration through lava, and more rarely, perennial riparian areas.

Ecological integrity is the abundance and diversity of organisms at all levels, and the ecological patterns, processes, and structural attributes responsible for biological diversity and for ecosystem resilience. Therefore, ecosystem integrity determines how species-rich an ecosystem is, and how well it functions. Two important aspects to ecological integrity are biodiversity and habitat. When healthy habitat is present, many species of plants and animals can survive and thrive. In addition, ecological integrity is present when an ecosystem is characteristic for its region. The components that must be present are the organisms and communities of organisms, as well as physical components such as water, soils, and processes such as succession and nutrient cycling, which are characteristic in the habitat and that are minimally disturbed. The NCA exhibits a high level of ecological integrity through highly diverse soils, geologic features, vegetative communities, and habitats that provide food/nutrients, water, and shelter for a variety of plant and animal species at multiple trophic levels. Conservation of the kinds of habitat that are characteristic of the NCA is essential to the maintenance of the biodiversity and ecological integrity of the area.

Habitats of the NCA vary with elevation (6,500 to 8,000+ feet) and soil substrate (volcanics, sand, and clay). These include, but are not limited to, valleys and alluvial plains containing chaparral and grasslands, rocky terrain and slopes containing piñon-juniper woodlands, and northern aspects and lava flows containing isolated stands of ponderosa pine (rarely accompanied by Douglas fir). Additionally, there are unique and ecologically important cryptobiotic colonies (some of which are presumably more than 100 years old) as well as unique lava tubes that form shelter for many species, especially bats. Contiguous wild lands of the National Park Service and Acoma Pueblo nearly doubles NCA habitat and allows movement of mega fauna.

Ecological integrity in the NCA is important because it supports and maintains the biotic, as well as the abiotic. The integrity of ecological resources is based on resistance to degradation and resilience to change maintained by the biotic and abiotic components of the ecosystem. Ecosystem structure and function are controlled by the variety of biotic and abiotic factors found in an ecosystem. Resistance to degradation refers to an ecosystem's ability to maintain its structural and functional attributes when stress and disturbance occurs. Resilience to change refers to an ecosystem's ability to regain structural and functional attributes that have been harmed by stress or disturbance. Ecosystem integrity involves the condition of an ecosystem that displays biodiversity and is capable of sustaining normal ecosystem function. It is impossible to remove all forms of stress and disturbance from an environment, thus the resistance and resilience of an ecosystem play important roles in maintaining ecosystem integrity and health while protecting ecosystem diversity.

Status of Ecological Resources	Trend
Fair	Declining

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
262,100	120,000	120,000	6,000

Stressors Affecting Ecological Resources

Past land uses - Although absent at the NCA, poplars are present in similar conditions at NCA borders. Human removal may account for this absence, and repopulation may speed the restoration of incised arroyos.

Climate change - Effects of long term regional warming and concomitant drought are highly impactful globally and await local study in the NCA.

Invasive species - Russian thistle and other non-natives, as well as native cacti, forbs, shrubs, and trees have largely expanded into areas lacking a complete grass population.

Livestock - Many grasslands have been grazed to the point of being populated by a single grass species. Regionally, less-grazed grasslands manifest a diversity and much greater grass abundance.

Erosion - Deficit grass populations reduce resistance to erosion during high volume summer rains. Degradation has continued from historic times and is punctuated by deeply incised arroyos and dropping water tables.

Incomplete biologic inventory hinders the ability to establish baselines from which to base decision making for numerous resources within the NCA.



Scenic Resources

The most recognized scenic resources in the NCA are La Ventana Arch, the sandstone cliffs of The Narrows, the volcanic cones of the Chain of Craters, and the striking and rugged lava flows. Spacious, undeveloped views throughout the NCA provide visitors with an opportunity to experience a landscape with little change since the industrialization of the Nation. The subtle nature of the homesteads and Ancestral Puebloan sites that occur in some areas presents unique scenes to visitors from developed areas.

Stressors Affecting Scenic Resources

Erosion - This is accelerated from diminishing run-off retention by grasses and shrubs, and increases incision of arroyos.

Off Road Vehicles - Occasionally, off-road vehicles venture off designated roads to avoid muddy sections or to lessen walking distances. The results vary from new visual scars of flattened vegetation to churned up muddy soils and route widening.

Status of Scenic Resource	Trend
Good	Stable

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
262,100	262,100	131,000	131,000

Scientific Resources

The NCA provides the setting for science-based research on geological, archeological, ecological, and cultural resources in a protected locale for which the NCA was designated. The NCA has been the setting for and provides continuing and new opportunities for large landscape-scale scientific research on approximately 230,000 acres. The opportunities for large scale research is further augmented by the NCA’s setting adjacent to National Park, National Forest, and Indian Reservations which also protect, to their own degree, large landscapes. The NCA is compatible to research in geology, volcanism, pedology, fire ecology, forestry, botany, wildlife biology, paleontology, climate change, and anthropology. This includes:

- Dendro-chronology studies reveal vast precipitous swings into wetter or drier periods that can help us understand modern climate cycles. Archaeological sites preserve timber that reveal fire activity and periods of drought.
- Ancient fire activity and fire regime cycles likely correlates with human activity and climate factors. This is understudied.
- Volcanoes cover over half of the NCA with age ranges from 3,800 to 700,000+ years. The volcanoes provide for a variety of studies including paleomagnetic records, volcanogenesis, precise age dating, formation of soils, compositional studies, and (with younger flows) studies on volcanic effects on humans.
- Special ecological relationships exist within the NCA including those related to water movement and sequestration of water through the landscape, and the trophic relationships between species. These subjects are understudied.
- Long-term climate change is observed in the cliffs which exposes desert sands later covered by ocean beach sandstones and deep water clays. These rocks, and their associated fossils, provide insight into climate change cause and effect.
- The NCA has been utilized extensively by people as evidenced by ancient pueblos to very recent homesteads. Studies of the uses that have occurred in the NCA can help us understand the cause and effect of people to the environment and the environment to peoples’ use. Past uses include Paleo and Archaic Indian agriculture, Navajo and European agriculture, logging, ubiquitous grazing of livestock, and settlements. Understanding the uses and changes in use patterns has application in understanding how to better manage resources in a changing climate as well as how to establish restoration objectives for degraded landscapes.

Status of Scientific Resources			Trend
Good			Stable

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
262,100	131,000	131,000	32,750

Stressors Affecting Scientific Resources

1. Long Term Climate Change - The International Panel on Climate Change and other studies connect climate change with these scientific resources. The severity of these changes is increasing as is the likelihood of further increase. Whatever change occurs, past scientific evidence is increasingly likely to be lost.
2. Short Term Climate Change - Single rain event severity and interim drought conditions are intensifying erosion, especially noted in arroyo growth. What were once dirt vehicle routes are becoming arroyos.
3. Grazing is impacting the remaining evidence of healthy grass and forb assemblages which were present in the NCA prior to settlement.
4. Forest density and diversity is being reduced by warming and drying trends with concomitant insect attacks. Changing fire frequencies and management suppression strategies could retard or enhance forest evolution.
5. With increasing visitor use has come increased illicit off-road driving and increased erosion.
6. Historic and Ancestral Puebloan structures undergo accelerated decay from mega fauna (e.g. elk, cows) trampling, and ongoing erosion, in addition to ordinary weathering.
7. A lack of comparative species inventory hinders sound decision-making for numerous resources within the NCA. Funding shortages hinders the research efforts typically used in management decisions at an NCA level.



West Malpais Wilderness

Wilderness Resources

Within the NCA are two wilderness areas (Cebolla and West Malpais) and three Wilderness Study Areas (El Malpais, Chain of Craters, and Canyons). At 144,640 acres, these resources represent approximately 64 percent of the NCA. This value of the NCA is a resource that allows for natural processes that are not manipulated by human activity, natural ecosystems in their primeval condition, landscapes undeveloped by structures, installations, vehicles, or motorized equipment, and provides outstanding opportunities for solitude or primitive and unconfined recreation. These wilderness resources include the supplemental values of archaeological and cultural vestiges of past human activity, and the geologic resources from past volcanic activity.

Stressors Affecting Wilderness

Vehicle traffic and vehicle routes - Off-road vehicle traffic sometimes illegally occurs within both the wilderness and wilderness study of the NCA. This activity occurs throughout the year, and peaks during hunting season. Some routes in the wilderness study areas (pre-existing routes may be used by vehicles as long as impacts do not exceed conditions at time of designation) have experienced erosion which impacts to wilderness resources that make them impassible, and further contributes to drivers traveling off designated roads.

Ecological changes - Wilderness is managed to preserve its primeval condition. However, human-induced changes threaten to alter species composition and natural processes within the wilderness. This is described in greater detail in the Ecological Resources section in page 19.

Status of Wilderness	Trend
Fair	Declining

Acres in Unit	Acres Inventoried	Acres Possessing Object	Acres Monitored
262,100	262,100	124,100	80,000

Summary of Performance Measures

Summary Table		
Resource, Object, or Value	Status	Trend
A. Archaeological & Cultural	Good	Stable
B. Ecological	Fair	Declining
C. Geological	Good	Stable
D. Scenic	Good	Stable
E. Scientific	Good	Stable
F. Wilderness	Fair	Declining



NATIONAL CONSERVATION LANDS

Bureau of Land Management

Rio Puerco Field Office

435 Montaño, NE

Albuquerque, NM 87107

Phone: 505.761.8700

www.blm.gov/nm/elmalpais